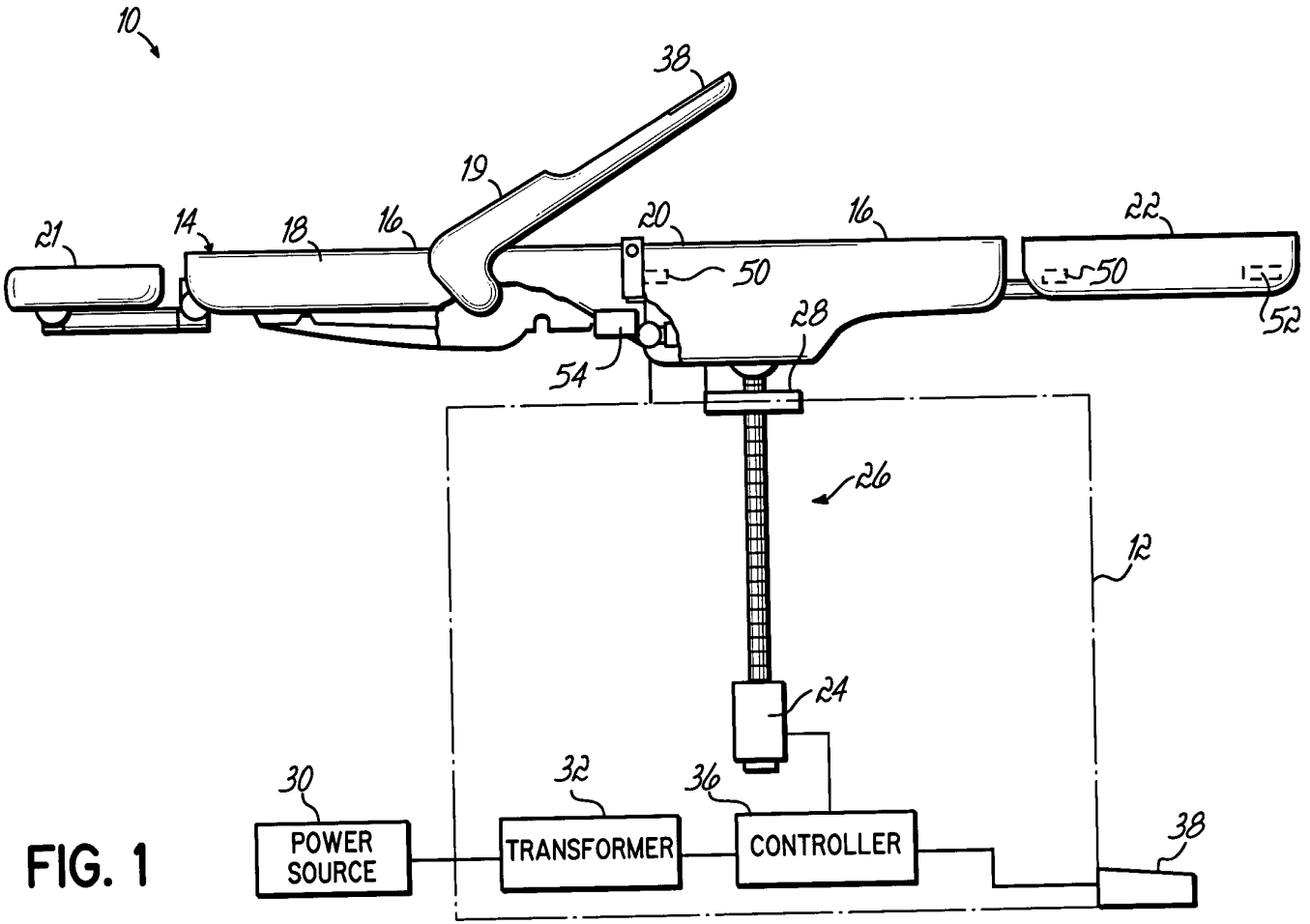
10
38
19
21
14
18
16
20
16
22
50
50
52
28
54
26
12
24
30
32
36
38
POWER SOURCE
TRANSFORMER
CONTROLLER

FIG. 1

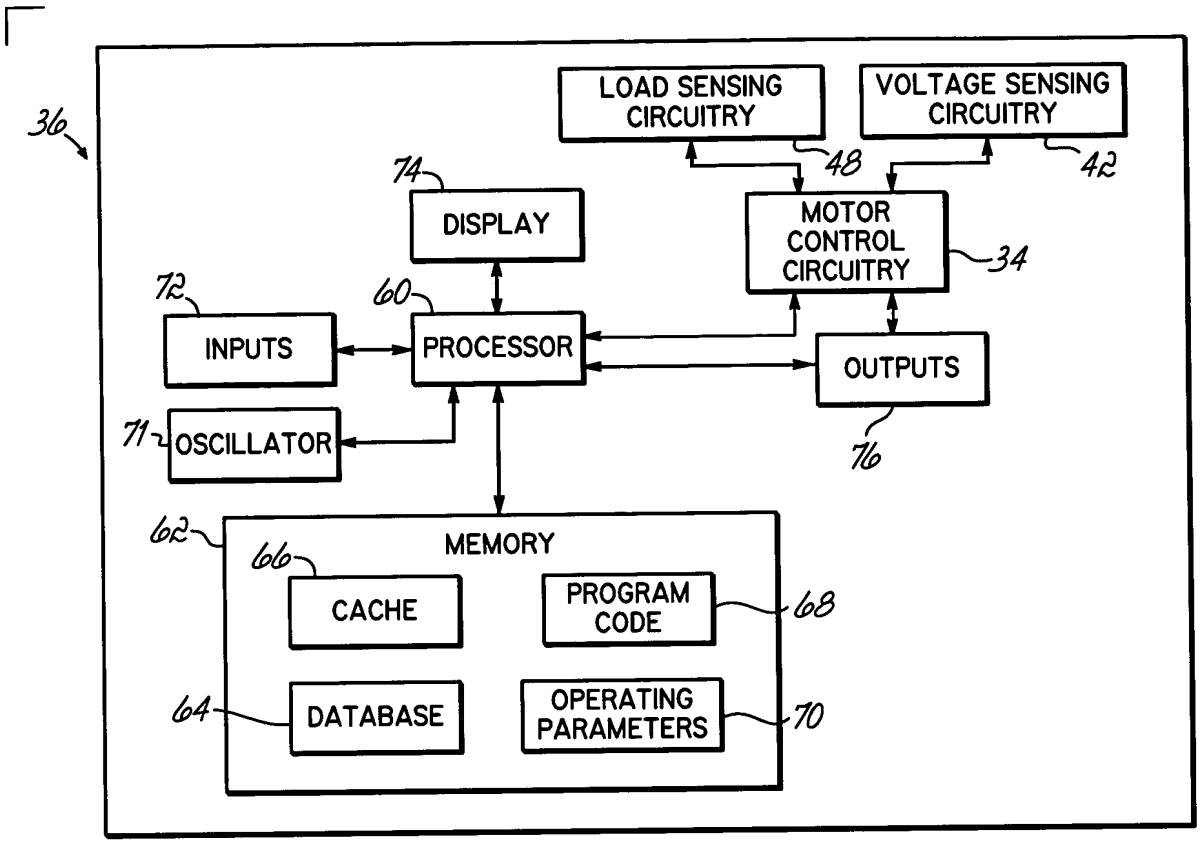
36
LOAD SENSING CIRCUITRY
VOLTAGE SENSING CIRCUITRY
48
42
74
DISPLAY
MOTOR CONTROL CIRCUITRY
34
72
60
INPUTS
PROCESSOR
OUTPUTS
71
OSCILLATOR
76
62
MEMORY
66
CACHE
PROGRAM CODE
68
64
DATABASE
OPERATING PARAMETERS
70

FIG. 2

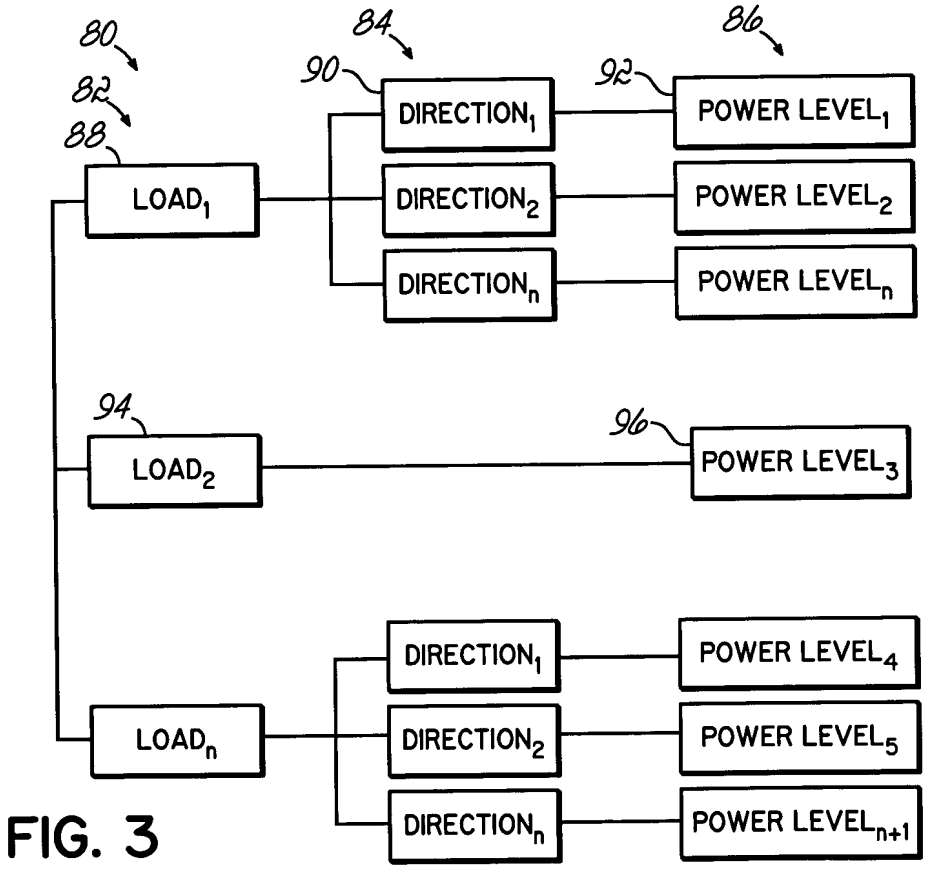
80
82
84
86
88
90
92
LOAD1
DIRECTION1
POWER LEVEL1
DIRECTION2
POWER LEVEL2
DIRECTIONn
POWER LEVELn
94
96
LOAD2
POWER LEVEL3
LOADn
DIRECTION1
POWER LEVEL4
DIRECTION2
POWER LEVEL5
DIRECTIONn
POWER LEVELn+1

FIG. 3

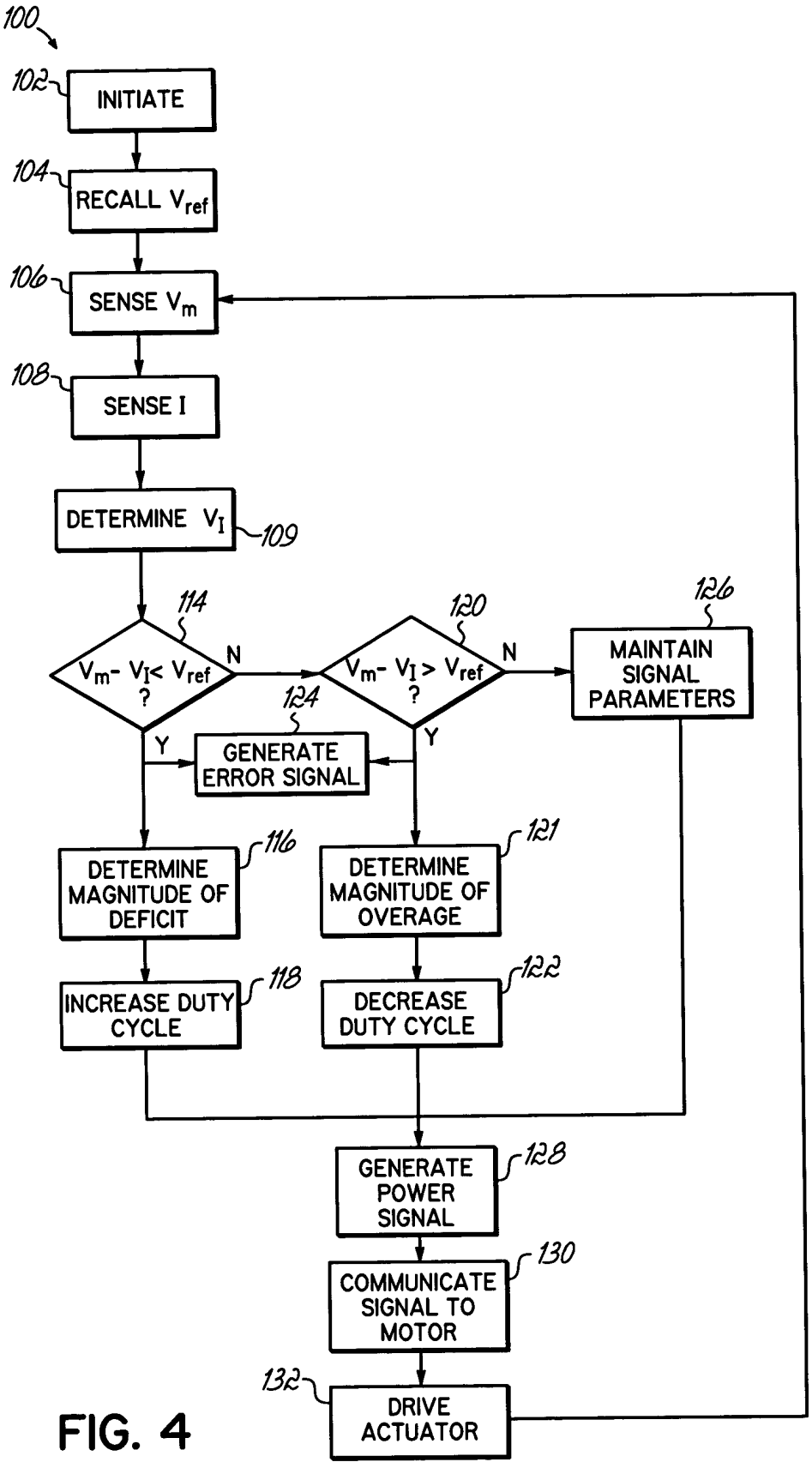
100
102
INITIATE
104
RECALL V_{ref}
106
SENSE V_m
108
SENSE I
DETERMINE V_I
109
114
$V_m - V_I < V_{ref}$?
N
Y
120
$V_m - V_I > V_{ref}$?
N
Y
126
MAINTAIN SIGNAL PARAMETERS
124
GENERATE ERROR SIGNAL
116
DETERMINE MAGNITUDE OF DEFICIT
121
DETERMINE MAGNITUDE OF OVERAGE
118
INCREASE DUTY CYCLE
122
DECREASE DUTY CYCLE
128
GENERATE POWER SIGNAL
130
COMMUNICATE SIGNAL TO MOTOR
132
DRIVE ACTUATOR

FIG. 4

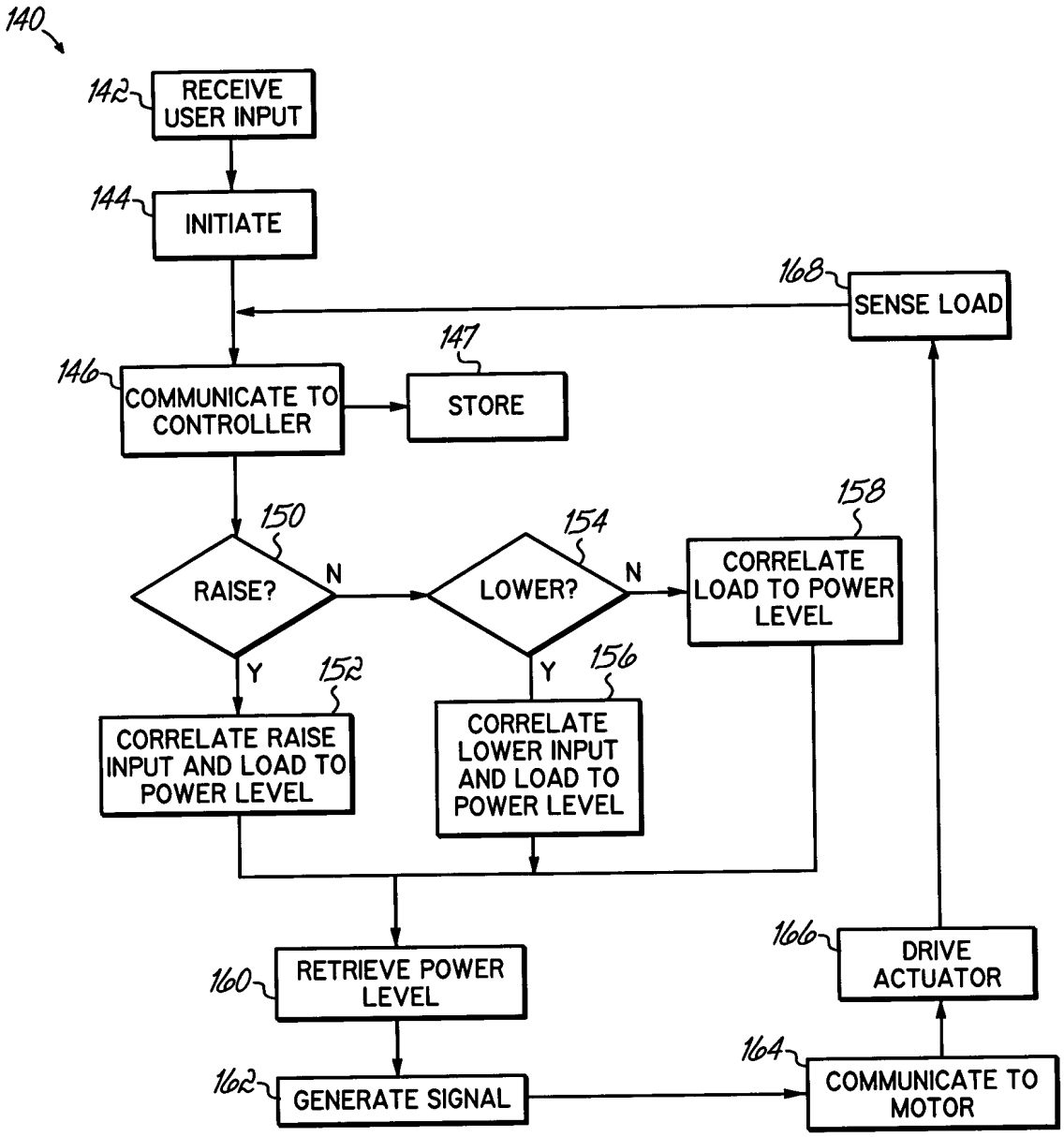
140
142
RECEIVE USER INPUT
144
INITIATE
168
SENSE LOAD
147
146
COMMUNICATE TO CONTROLLER
STORE
150
154
158
RAISE?
N
LOWER?
N
CORRELATE LOAD TO POWER LEVEL
Y
152
Y
156
CORRELATE RAISE INPUT AND LOAD TO POWER LEVEL
CORRELATE LOWER INPUT AND LOAD TO POWER LEVEL
166
DRIVE ACTUATOR
160
RETRIEVE POWER LEVEL
164
162
GENERATE SIGNAL
COMMUNICATE TO MOTOR

FIG. 5